UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte JOHN J. HARRINGTON, BRUCE A. SHERF, and STEPHEN RUNDLETT

Appeal 2007-0178
Application 09/484,331
Technology Center 1600

Decided: November 30, 2007

Before TONI R. SCHEINER, NANCY J. LINCK, and RICHARD M. LEBOVITZ, *Administrative Patent Judges*.

LINCK, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a 35 U.S.C. § 134 appeal in the above-referenced case.[1]

We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

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[1] The application was filed January 18, 2000. The real party in interest is Athersys, Inc. It is a division of Serial No. 09/276,820 (now issued as U.S. Patent No. 6,897,066).

STATEMENT OF THE CASE

The fields of the invention are molecular and cellular biology (Specification ("Spec.") 1). In the prior art, homologous recombination has been used to activate gene expression in a cell, based on knowledge of a target gene, and then culturing the "homologously recombinant cells under conditions that select for amplification" (*id.* at 3-4).

In order to discover novel genes not previously identified as targets, Appellants use non-homologous rather than homologous recombination to identify the genes and then screen the cells for expression of the gene (*id.* at 5). In other words, Appellants' method can be used to "randomly activate genes" and produce cells that "express a gene of interest or acquire a phenotype of interest from activation by the vector" (Dhanoa Declaration (hereafter "Dhanoa" 2)). A term used for this technology is "RAGE," and cells activated by this method are called "RAGE-activated" cells (*id.*).

Following identification of the expressed gene, it can then be isolated and purified to use in drug discovery (Spec. 7). "In highly preferred embodiments, the cells expressing the endogenous gene product are cultured so as to produce amounts of gene product feasible for commercial application, and especially diagnostic and therapeutic and drug discovery uses" (*id.* at 11-12).

According to the Specification, Appellants' methods are "capable of identifying new genes" that have been or could have been "missed using conventional and currently available cloning techniques" (*id.* at 32). Further, these "unknown and/or uncharacterized genes can be rapidly

identified and over-expressed to produce proteins" useful as "human therapeutics and diagnostics and targets for drug discovery" (*id.*).

Thus, Appellants' claimed assay method (a drug discovery tool) utilizes techniques well known in the art of drug discovery but substitutes the step of homologous recombination with non-homologous recombination (*id. passim*).

The claimed subject matter is reflected in the two claims on appeal:[2]

69. A method for drug discovery comprising:

(a) integrating a vector, comprising a promoter, into the genome of one or more eukaryotic cells, by non-homologous recombination, wherein said promoter activates expression of an endogenous gene in said one or more cells;

(b) culturing said one or more cells under conditions favoring expression of said activated gene, thereby producing a gene product of said activated gene;

(c) screening said one or more cells for a cell in which a desired gene is activated or for a cell in which a desired phenotype is induced by said activated gene;

(d) treating said cell, in which said desired gene is activated or in which said desired phenotype is induced, with one or more test compounds to be screened for drug activity; and

(e) determining the ability of said one or more test compounds to interact with a product of said desired activated gene or to affect said desired phenotype.

70. The method of claim 69 wherein the gene product is protein, the protein is purified from the cell and the test compound is exposed to the purified protein.

[2] These are the only pending claims in the application (Appeal Brief (rec'd Oct. 06, 2005) (hereafter "App. Br.") 2).

The Examiner has rejected claims 69 and 70 under 35 U.S.C. § 112, ¶ 1, for failing to comply with the written description and enablement requirements (Examiner's Answer (mailed May 3, 2006) (hereafter "Answer") 3, 5).

PATENTABILITY UNDER § 112, ¶ 1

The Written Description Issue

To support her written description rejection, the Examiner found that the "specification provides literal support for the concept 'drug discovery', but fails to outline the method steps that would be associated with this methodology as set forth in the present claims" and "support for the specific method steps" is "not associated with drug discovery" (Answer 3-4).[3] The Examiner also found Appellants' "determining" step (e) is "very broad encompassing any means of assay" (*id.* at 4).

Appellants argue that the steps necessary for drug discovery "would have been recognized immediately by one of ordinary skill in the drug discovery industry" (App. Br. 5). For support, Appellants rely on the Dhanoa and Bennani Declarations (Appeal Brief (rec'd Oct. 5, 2005) ("App. Br.") 4-13 (see particularly App. Br. 4-5 & 8)). Appellants' position is that "the Examiners have impermissibly substituted their opinions for an expert's opinion which was based on sound scientific reasons about what the ordinary skilled artisan would have recognized from the Appellants' specification" (App. Br. 9).

In view of the above, we frame the written description issue: Does Appellants' Specification contain a written description sufficient to show

[3] We note that at least two examiners worked on this application, and the examiners' positions have shifted significantly throughout prosecution.

they had possession of their claimed invention at the time the application was filed, in view of the state of the art at that time?

The Enablement Issue

The Examiner also concluded Appellants' claims lack enablement (Answer 10-14). According to the Examiner, the "critical flaw in both declarations and the disclosure . . . is that the art does not recognize cells generated by the random insertion of a gene trap vector which results in the activation of an endogenous gene to be a system for drug discovery" (*id.* at 10). While admitting that "methods of making a cell using a gene trap vector and methods of drug discovery are generally known and practiced in the art," the Examiner concluded the Specification does not provide "the necessary guidance to combine these two technologies/methodologies" (*id.* at 12). According to the Examiner, because of lacking "necessary guidance," the claimed invention would have required "an undue amount of empirical experimentation . . . to establish the material as appropriate for use in methods of drug discovery" (*id.* at 14).

Appellants respond that their presently claimed invention provided the "nexus" between their method of making a cell using a gene trap vector and drug discovery (Appellant's Response to Examiner's Answer (hereafter "Reply Br.") 8 (citing Dhanoa 7-8)). According to Appellants, their "cells would be just as likely to provide a target for drug discovery as cells expressing proteins from exogenous DNA" and would have allowed "the artisan to expose the cell to a compound and assay for the effect of the compound on expression of any desired gene" (Reply Br. 10). For these reasons, among others, Appellants' argue their cells would have been

"reasonably expected to be equally amenable to the drug discovery process," i.e., could have been used "without undue burden of experimentation" (*id.*).

In view of these conflicting positions, we frame the enablement issue: Would one of ordinary skill in the relevant art have been able to make and use Appellants' claimed invention in view of the Appellants' teachings and what was known at the relevant time without undue experimentation?

Findings of Fact Relating to § 112, ¶ 1

1. "Methods using cells and purified proteins in identifying compounds as potential drug candidates" were known and used in the art at the time the claimed invention was made (Answer 4).

2. Gene trap vectors were also "known in the art" and "used commonly as research tools to identify or characterize the consequence of altering gene expression in a cell" (*id.*).

3. The Specification "provides support for making and purifying a protein of an activated gene" (*id.*).

4. The Specification also provides "working examples for the use of gene trap vectors in identifying or altering gene expression in a cell" (*id.* at 5).

5. The skilled artisan could have practiced the "specific method steps required to generate cells in which a gene trap vector" had been inserted in the "genome of a cell" (*id.*).

6. The skilled artisan could have practiced "methods of 'drug discovery' using identified and characterized systems" (*id.* at 6).

7. Both cell-based and protein-based assays formed the basis for successful drug discovery programs prior to Appellants' filing date (Dhanoa 7).

8. At the relevant time, cell-based assays did not require isolation of a protein to conduct initial compound testing (Dhanoa 8).

9. Thus, cells could have been "cultured *in vitro* and used for drug discovery" without isolating the related protein (Dhanoa 8 (citing Spec. 9, ll. 12-15 & 45, ll. 22-25)).

10. At the relevant time, drug discovery using a cellular system involved screening for biological activity against random compound libraries and routinely encompassed "large numbers of compounds . . . in order to maximize hit rates" (*see* Bennani Declaration (hereafter "Bennani") 3).

11. Therefore, at this early stage of drug discovery, "compound structure is not a consideration" (Bennani 3).

12. Once a compound had been identified using high-throughput screening, characterizing the compound would have been "typical and routine" (Bennani 4).

Discussion of the § 112 ¶ 1 Rejections

The Examiner "bears the initial burden . . . of presenting a prima facie case of unpatentability." *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). Based on the evidence of record in this case, the Examiner has failed to carry that burden with respect to both grounds of rejection (*see* Findings of Fact (hereafter "FF") 1-12). In fact, the Examiner's own admissions support just the opposite conclusions (*see* FF 1-6). All steps of Appellants' claimed method were known in the art (*id.*). Appellants merely substituted the use of homologous recombination with non-homologous recombination (Spec. 1-10).

Accordingly, we find the Specification contains a written description sufficient to show Appellants had possession of their claimed invention in view of the state of the art at the relevant time. *See, e.g., Capon v. Eshhar*, 418 F.3d 1349, 1359 (Fed. Cir. 2005) (noting the importance of considering the state of scientific knowledge in deciding a written description issue). For the same reasons, we conclude Appellants' Specification would have taught the skilled artisan how to make and use their claimed invention without undue experimentation at the relevant time. *See, e.g., Monsanto Co. v. Scruggs*, 459 F.3d 1328, 1338 (Fed. Cir. 2006) (focusing on level of skill and "publicly available information" to reject a non-enablement argument). In this case, the Examiner failed to give sufficient weight to these *Wands* factors (*see* Answer 5-7).

We have considered the Examiner's additional arguments and Appellants' responses. We conclude Appellants have fully and convincingly addressed these arguments. Accordingly, we remain unconvinced the Examiner has made a prima facie case of unpatentability with respect to either ground of rejection.

CONCLUSION

In summary, we reverse both grounds of rejection of claims 69 and 70 based on 35 U.S.C. § 112 ¶ 1.

REVERSED

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